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James B. LaFrentz and Ila LaFrentz v. *3M Company, et al.*
IN THE UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION
Case No. 4:18-CV-04229

EXPERTS REPORT

I have been asked to write an experts' report on the respirators used by James B. LaFrentz during his employment with General Dynamics/Lockheed Martin in Fort Worth, Texas. Mr. LaFrentz was hired in early 1979 by General Dynamics and retired from Lockheed Martin in January 2005 with 26 years of employment. Lockheed Martin purchased General Dynamics' Fort Worth, Texas operations in 1993. Mr. LaFrentz worked at many occupations for many employers during his working lifetime starting with summer employments during his high school years which ended with graduation in 1963. He worked at odd jobs in Texas until he moved to Ohio to help an ill relative with a small farm. While working on the farm he also had several other jobs including building of mobile homes, simple plumbing, and go-fer, simply stated, he was a jack of all trades. In 1978 he moved back to the Fort Worth, Texas area and for about a year took a job as a metal lathe operator. During all of those years he did his civic duty by enlisting in the Texas National Guard in December of 1964 and served in a quartermasters unit and did some helicopter maintenance, From 1971 to 1978 he served in the Army Reserves while in Ohio, then upon his return to Texas he served in the Air Force Reserves to retirement in1991. None of the employment or jobs that Mr. LaFrentz had of with the exception the first 3 years at General Dynamics could have resulted in any appreciable exposures to asbestos.

For the first 3 years of his employment with General Dynamics from 1979 thru 1981 Mr. LaFrentz was a drill press operator, and much of his work was drilling 1/2" holes thru coupons which were strips of aluminum or aluminum alloy with asbestos containing composite material approximately 1 - 2" thick attached with an unknown adhesive. After drilling, Mr. LaFrentz sanded the holes smooth with a small belt sander or a circular pneumatic sander. The coupons, sometimes referred to as panels, were of three types, honeycomb, panel, and strip and were approximately the size of a sheet of paper, and all asbestos containing. He would drill the coupons 2-3 days per month and estimated that he drilled over 1000 panels during the 3 years that he operated the drill press. Mr. LaFrentz testified that when he drilled the coupons the operation created a visible heavy concentration of black particles or ash and a terrible smell. He also testified that after the first time he drilled the strips that he complained to his supervisor about the dust and smell and was told to get a respirator from the parts guy and he could also talk to the safety person about the problem. He noted that the dust was so heavy that he had to wipe it off of his face. He went to the parts room and was issued a 3M 8710 paper mask which he wore every time that he drilled coupons, cleaned his work area, or any other time he

could see visible dust. He testified that when he wore the respirator while working in the dusty environments that he still got visible dust on his face under the respirator and noted that he had to wipe it off of his face when he took the respirator off. By his testimony and description of the respirator, there is no doubt in my mind that Mr. LaFrentz has identified the 3M 8710 single use or filtering facepiece respirator. The safety person arranged with Mr. LaFrentz to come to his area when he was drilling and sanding and sample the air. After sampling, the safety person left and later returned to give Mr. LaFrentz a sheet that gave the sampling results that were many times the legally allowed exposure limit. She advised Mr. LaFrentz to keep the sheet. In August 2018, Mr. LaFrentz was diagnosed with malignant mesothelioma.

In preparation for developing this report, I have reviewed many documents including Mr. LaFrentz sworn testimony depositions of November 14, 2018, and November 15, 2018, Interrogatories, and some of Mr. LaFrentz's medical records.

My qualifications to render these opinions include over 60 years of training, experience, and practice in the field of Industrial Hygiene with specialization in Respiratory Protection. I worked 14+ years with the University of California, Los Alamos Scientific Laboratory (LASL), Industrial Hygiene Group where I and co-workers conducted extensive testing and research on respirators. For the first 10 years, in addition to conducting research and testing on respirators, I managed the large and comprehensive LASL respirator program. .

My immediate supervisor and mentor for respiratory protection activities was Mr. Edwin C. Hyatt, generally referred to as grandfather of the respirator in the U.S. Our research and testing facilities and equipment were very impressive and complete. Because of the knowledge and facilities available at LASL and our independence from manufacturers, we were visited frequently by respirator manufacturers requesting our evaluation and opinions on revised and new respirators. We did those evaluations and made our comments and recommendations without charge because part of our task at Los Alamos was to stay abreast of new developments and make that information, where applicable, to other AEC laboratories. Some of the notable manufacturers who availed themselves of our services during my time at Los Alamos were AO, Willson, Acme, Scott, Welsh, MSA, 3M, and Survivair. During my time there, we tested and evaluated the 3M 8710 as well as many other manufacturers respirators of all types.

During those initial 10 years, when not performing the aforementioned duties, I was tutored and trained, one on one, by several outstanding Industrial Hygienists, in all aspects of Industrial Hygiene, i.e. Noise, Ventilation, Non-Ionizing Radiation, In Place Filter Testing of large filter banks, Air Sampling of all types, Particle Counting, and Toxicology. In short, Recognition, Evaluation, and Control of hazards in the workplace was taught to me under actual conditions. All of this qualified me for full membership in the American Industrial Hygiene Association (AIHA) in 1974.

For the last almost 5 years at LASL, I developed and taught very comprehensive 3 – 5 day respiratory protection courses presented to NIOSH, OSHA, AEC-DOS (AEC now DOE), the AEC-DRS (DRS now the NRC, and AEC Contractors personnel both at facilities in Los Alamos, NM and on-site as necessary. Those courses covered in depth discussions and demonstrations on all aspects of respiratory protection. In addition to general discussion on the normal 11 elements of a respirator program it is absolutely necessary for respirator program administrators, and for personnel who will enforce regulations, to fully understand all of the parts that comprise all negative pressure air purifying respirators, the variation of facepiece sealing edge shapes, the straps, and mask suspension by straps or harness, all of which are considerations of the respirators' design. The types of NIOSH approved filter media used for collection of particulates and the specific characteristics of filtration by those filters is another factor that must be considered. I began evaluating respirator facepiece design, and its importance in 1962 when manufacturers would bring revised or newly designed respirators to Ed Hyatt and I for our evaluation, and comments on design that would make their respirators perform at higher levels. Most factors of design correlate directly to the overall performance of the respirator and can define adequate protection or serious exposure to hazardous substances for the respirator user. After leaving the LASL, I was asked by NIOSH to develop and teach, for them, a course like I taught at Los Alamos. That course would be the first formalized curriculum on Respiratory Protection to be offered to Industry on an open enrollment, fee for attendance basis. I developed the NIOSH "593" Respiratory Protection Course in 1975 and taught it for several years at NIOSH facilities and many prestigious Universities, NIOSH Resource Centers, across the U.S.

For the past 40 years, I have worked as a consultant on respiratory protection, providing general consultation, respirator training, respirator fit testing services and expert witness services to clientele that represent virtually all types of government and industry respirator users. I presented my companies' Respiratory Protection 134" course, a course the same as the LASL course, and the NIOSH "593" course, for at least 2 respirator manufacturers and for many large Industrial companies.

All of the respirator courses that I have developed and taught over the years were hands-on courses where participants could perform fit tests, comparative evaluations of different respirators, filter efficiencies, simple filter degradation demonstrations, the effect of variations in design, etc. All 3 of the "Respiratory Protection" courses included a massive display of all types of respirators from air purifying thru the most sophisticated atmosphere supplying respirators such as SCBA, Airline respirators and combinations of same. In all I have taught courses for the U.S. Army, U.S. Navy, U.S. Air Force, U.S. Special Forces, OSHA, NIOSH, U.S. DOE, U.S. NRC, and virtually all types of industries.

In the early to mid-1980's, at the request of a new client and past class participant, I evaluated a work situation that required respiratory protection. The situation required emergency work on a 5-story tower that gave access to the Chemical Reactor Vessel surrounded by the tower. Since the use would involve unknown releases of chemical vapor concentrations and known Immediately Dangerous to Life or Health concentrations and required entry into the area and could require considerable time to correct the incident, there were no NIOSH/MSHA approved respirators that could be applied. Based on my survey findings I designed a pressure demand combination supplied air with 30-

minute self-contained breathing apparatus. I talked with one of the large manufacturers of SA/SCBA equipment who was not interested in working on the project and getting it approved. The second large manufacturer was definitely interested and was willing to work with me to take a basic unit that they had and make the necessary modifications to meet our design specs and ultimately got the apparatus NIOSH/MSHA approved and found sales to other respirator users with similar situations. Mr. Wayde Miller of MSA, then the product manager for respiratory protection worked with me on the project to change and modify an MSA work mask with me on the project to change and modify an MSA work mask with special dual hose connectors on the regulator, and several other modifications unique to the application.

My opinions are based on the extensive testing in which I have participated, my personal exposure to, and the handling of respirators for many years, and the vast amount of scientific literature and data that I have read over the past 60 years. My CV is attached for verification of specific details of my qualifications.

Respirator Specified and Described by Mr. LaFrentz as The Only One He Used During His Career

3M 8710

The 3M #8710 respirator was introduced, at least in prototype form, in the late 1960's. 3M marketing representatives brought samples of the prototypes, and later' approved versions of the 8710 to Edwin C. Hyatt and me at the Los Alamos Scientific Laboratory (now the Los Alamos National Laboratory) for our evaluation and opinions. I was personally involved with most of that testing and evaluation at Los Alamos. Our opinions were negative based both on visual evaluation of design and actual testing of the respirators. (The 3M #8710 had many of the same bad characteristics as the non-approved and non-approvable 3M #8500 that 3M had been very actively marketing since the early 1960's to the same industries as they marketed the #8710. The 3M 8500 is a direct descendent of a failed disposable bra.) The 3M 8710 was the first single-use respirator approved by NIOSH and/or the Bureau of Mines and was approved under the provisions of 30 CFR Part 11 and was issued approval number TC-21C-0132 in May of 1972. This new approval category appeared for the first time with NIOSH's entrance into the respirator testing and certification arena, and the publication of the first joint approval schedules from the Bureau of Mines and NIOSH in March of 1972. Prior to 1972, and the advent of the revised approval criteria in Title 30, Code of Federal Regulations, Part 11 (30 CFR 11), there were no classification or provisions under which single-use respirators could be tested and approved. When those provisions ultimately appeared in 30 CFR 11, they allowed approval only for pneumoconiosis- and fibrosis-producing dusts. Testing of the single-use respirators by NIOSH necessitated the exclusion of important design and test requirements required of good elastomeric respirators. The "paper" material of construction of the 8710 was upgraded from that of the 8500 to pass at least an absolute minimum test requirement that appeared for the first time in a brand new category of dust, fume, mist approval titled "single use respirators". The 8710 could not be fit tested, it was impossible for the user to perform any seal check after donning, and the malleable metal nosepiece added additional variables to the facepiece leakage problems. These poor design features required that NIOSH ignore

testing & design requirements in subpart "K" of 30 CFR part 11 to approve the substandard "Single Use" respirators. There were definitely inconsistencies by NIOSH in development and implementation of approval criteria for single-use respirators.

Some of the negative influences of the 3M #8710 respirator are as listed:

Facepiece – Made of paper/fabric/fiber filter media, it is impossible to obtain a seal of the respirator to the face. A malleable aluminum strip across the nose area of the respirator suggests that the user can obtain facepiece fit across the nose bridge. The adjustment of the stiff strip as instructed by the manufacturer is very difficult, if not impossible, and if some semblance of adjustment is initially achieved, the piece of aluminum relaxes and reshapes itself very quickly. The valveless design of the respirator promotes considerable condensed moisture collection on the fibers which increases the pressure drop or breathing resistance causing the loss of rigidity and additional facepiece to face seal leakage.

Filter Efficiency – The paper/fabric filter media is of the lowest efficiency acceptable to the Bureau of Mines/NIOSH for approval. Testing of the filter media at Los Alamos revealed a very low efficiency. Since leaving Los Alamos, I have done some simple testing that revealed different filter efficiencies at different areas on the same facepiece.

Facepiece Fit Test – A facepiece fit test requires the application of an acceptable test atmosphere to define a proper seal of a respirator to a user's unique facial contours or the lack of that seal. A proven qualitative or quantitative fit test methodology using an acceptable test atmosphere must be performed to ultimately define the acceptability of the selected make and model respirator on the user. For the first 10 years of Bureau of Mines/NIOSH approval of the 3M 8710, there was absolutely no means of performing any fit test. In the early 1980's, a qualitative test method utilizing saccharin as the test atmosphere was introduced by 3M. Evaluations of the test methodology by me and others suggest that the fit test was developed more to pass the respirators than to define the adequacy or inadequacy if the facepiece to face seal.

User Seal Check – After passing a respirator fit test it is imperative that the respirator users have a means by which to evaluate the proper seal of that respirator facepiece to face each time the respirator is donned. Due to the inadequate design of the 3M 8710, it is impossible to conduct such a test. NIOSH has acknowledged the fact that they have never evaluated and make no recommendation for performance of the user seal check recommended by 3M. In addition, NIOSH acknowledges that it is impossible to perform a meaningful user seal check on single use or filtering facepiece respirators. The 3M instructions for performing a user seal check are very misleading, and a rather blatant disservice to respirator users for the following reasons:

a) It is impossible to produce a sufficient positive or negative pressure inside the facepiece when the facepiece seal is paper/fabric.

b) Attempts to cup the hands over the facepiece results in distortion of the facepiece as well as pressing the respirator facepiece tighter against the face than it would be held by the straps.

c) The instruction to blow hard causes most users to "puff" their cheeks which results in a false configuration of the seal area of the facepiece that would not represent normal use conditions.

SUMMARY

Based on the considerations for the 3M #8710 respirators identified in this report, it is my professional opinion that the subject respirators did not provide sufficient protection to prevent inhalation exposure of Mr. LaFrentz to very substantial amounts of airborne respirable asbestos fibers.

All of my opinions expressed herein, and those which will be given at trial, are to a reasonable degree of professional and scientific certainty.

Respectfully Submitted,

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